Americas

Pre-Job Hazard Assessment

S3AM-209-FM4

Location: Bathymetric Survey on Willamette River, Portland, Oregon

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Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
List principal activities involved in the scope of work	Identify each safety or health hazard		Identify engineering and administrative controls and any specific Personal Protective Equipment (PPE) that is required	
ACTIVITY 1 – Mobilize personnel and equipment to study area.	Traffic/driving hazards	10	• All drivers must have current, valid driver's license on their person. • Complete pre-use visual inspection. Walk around the vehicle to inspect for potential hazards or mechanical issues before driving. • Practice defensive driving and drive in a courteous manner. • Seat belts must be worn by the driver and all passengers. • Obey all speed limits. • Drivers must not use cellular telephones or other communication devices such as two-way radios unless safely parked. • Window surfaces must be cleared of any materials such as ice, frost, mud, or water that can impair visibility. • Travel with headlights on at all times. • Travel during daylight hours when possible. • Equip vehicles with: first aid kit, fire extinguisher, flares or triangle, spare tire and jack, cell phone. • Limit activities to no more than 10-hour days. Implement fatigue management plan for >12 hour days.	5
	Parking hazards	10	Park in a clear location, and back in to parking location to avoid backing out upon departure	3
	Lifting hazards/muscle strain	6	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves when moving equipment. No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully.	3
ACTIVITY 2 – Hold Tailgate Safety Briefings and perform daily Task Hazard Analysis; review applicable Safety, Health, and Environment Procedures; inspect and don PPE; inspect vessel, tools and equipment.	Incorrect PPE usage	10	Safety Officer should check that required PPE is being used.	1
	Equipment malfunction	10	User (AECOM and/or Subcontractor Personnel) should inspect vessel, tools, and equipment before use.	1
	Lack of knowledge of tasks being performed	10	Discuss tasks to be performed by personnel, potential hazards, and control measures.	1
	Potential incidents and emergencies	10	• Follow daily safety briefing, have personnel sign attendance form, which will be maintained onsite. • Inform workers of emergency contact information, emergency procedures, and hospital route.	5

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Severe weather	10	Include discussion of severe weather hazards in daily safety briefing and monitor throughout the duration of the task. Implement severe weather procedures as applicable.	5
	Potential contaminant exposure	10	Inform workers of potential for contaminant exposure and implement contaminant exposure avoidance procedures outlined in HASP, as applicable.	3
ACTIVITY 3 – Evaluate area for hazards (this should be performed regularly throughout the duration of the task).	Slips, trips, and falls	8	Personnel should identify and take measurable cautionary steps to observe areas for hazards: ensure pathways are clear and free of obstruction prior to initiating work, ensure all lines are secure prior to initiating work, and adhere to proper housekeeping practices.	4
	Heat stress/cold stress	10	• Begin heat stress/cold stress monitoring as applicable and continue throughout duration of task. • Implement heat stress/cold stress prevention procedures, as applicable. • Heat stress: drink plenty of fluids and use appropriate work/rest schedule. • Cold stress: dress in appropriate cold-weather clothing and bring change of dry clothing stored in waterproof bag or stored in a dry place aboard the vessel.	3
	Water hazards	10	• Follow all appropriate water safety rules and regulations. • USCG Type III or IV approved flotation device will be worn when working near or over water.	5
	Severe weather	10	Assess severe weather hazards and implement appropriate severe weather procedures.	5
	Potential contaminant exposure	1	Maintain awareness of potential contaminant exposure and implement contaminant avoidance procedures.	3
ACTIVITY 4 – Load personnel and equipment onto vessel.	Lifting hazards/muscle strain/ergonomics hazards	10	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves when moving equipment. • No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully. • Transfer equipment to people on boat rather than carrying equipment onto boat.	3
	Vessel boarding hazards	10	• Receive vessel operator's training prior to boarding vessel. • Follow vessel operator's instructions for boarding vessel • USCG Type III or IV approved flotation device will be worn • Maintain three points of contact when boarding vessel. • Follow vessel operator's instructions for loading equipment onto vessel.	4
	Pinch points/hand injuries	8	Be aware of hands, feet, arms, and position of all personnel during tool use and equipment handling. Never position a hand where it can be pinched if a wheel rotates, a load releases, or a tool slips.	4
	Slips, trips, and falls	8	• Wear appropriate footwear with non-slip soles. • Ensure pathways are clear and free of obstruction prior to initiating work, ensure all lines are secure prior to initiating work, and adhere to proper housekeeping practices. • Maintain three points of contact when boarding vessel.	4
ACTIVITY 5 – Work aboard a research vessel on water.	Slips, trips, and falls	8	• Wear appropriate footwear with non-slip soles. • Ensure pathways are clear and free of obstruction prior to initiating work, ensure all lines are secure prior to initiating work, and adhere to proper housekeeping practices. • Maintain three points of contact at all times.	4

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Lines under tension/line of fire	10	Avoid keeping lines/ropes/cables under tension. Keep as much distance as possible between you and any source of potential energy release.	4
	Moving parts/pinch points/hand injuries	8	Be aware of hands, feet, arms, and position of all personnel during tool use and equipment handling. Never position a hand where it can be pinched if a wheel rotates, a load releases, or a tool slips.	4
	Water hazards	10	• Adhere to all federal, state, and local boating and licensing laws. • Work must be performed in accordance with the "Buddy System" Regulations. • US Coast Guard (USCG)-approved PFD, sized and adjusted to the wearer, shall be worn by all workers when aboard the research vessel unless inside an enclosed cabin or behind railing. • Vessel operator will provide a SH&E Orientation on boating operations prior to departing dock, which will cover the following: man overboard, power loss/disabled boat, fire onboard, medical emergency. • Vessel operator will submit a float plan to the Project Manager and follow the float plan and communication plan identified in the float plan. • Ring buoys with at least 90 feet of line or a Life Sling shall be provided and readily available for emergency rescue operations. • Ensure vessel has secondary means of propulsion such as twin engines, kicker motor, oars, or paddles. • During high-speed transit, the vessel operator shall check that all passengers are secure before coming up to speed and remain secure during the transit.	4
	Man overboard (MOB)/incapacitated person	10	Vessel operator will review USCG MOB procedures: • No low visibility/night operations will occur. • When deploying equipment, wear appropriate PPE (USCG Type III or IV life jacket, slip and abrasion resistant gloves, etc.). • When boat is transiting at high speeds, all people must remain in the cabin seated or standing maintaining four points of contact; no work on deck may occur. • All staff aboard vessel will be trained in MOB recovery training. • Perform safety briefing prior to departure and discuss MOB recovery procedure. • USCG Type III or IV PFD will be worn when outside of the cabin/wheelhouse or on dock • Life jackets shall be immediately available near exist inside vessels with cabins. • Person who observes person fall overboard must keep their eyes on him/her. • Immediately cease work operations and commence rescue procedures. • Immediately mark MOB location on GPS by "one-button *MOB* press". • Deploy Life Sling and circle person in water. • Bring the vessel to the position down current of the person in the water (as opposed to having the person swim to the boat) and disengage propulsion as person nears vessel. • Throw a flotation rings and other floating objects into the water to denote the location of the person overboard and to alert other boat traffic. • Throw PFDs or other floatable items into the water to assist the person overboard. • Send a distress call on Channel 16 if person is un-responsive or severely injured.	3

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	Boat in danger of sinking	10	Vessel operator will be responsible, however, if the vessel crew is incapacitated the following procedure shall be followed: • Don life jackets or immersion suits • Send a distress call: PAN call over VHF Channel 16 if boat is not in imminent danger. • Send a distress call: MAYDAY call over VHF Channel 16 if boat or crew is in imminent danger. • Turn on the bilge pump to begin pumping water to outside of boat. • Assemble the emergency pump and begin pumping water.	4
	Vessel fire	10	Review fire extinguisher location and quantity and confirm fire extinguishers are charged prior to leaving dock. In the event of fire, assess fire containment ability and if large and danger of explosion exists, prepare to abandon ship. If fire is containable, attempt to extinguish fire. Remember P.A.S.S: • **P**ull the Pin • **A**im the fire extinguisher at the base of the fire • **S**queeze the handle • **S**weep the base of fire side to side Hail for help **See Distress Call Form MAYDAY (life/death) or PAN (assistance required, not life and death).** Inflate life raft/abandon ship if necessary (e.g. risk of explosion).	5
	Medical emergency	8	• Review first aid kit location and contents prior to departure. • AED shall be readily available if vessel is greater than 20 feet. • If appropriate, initiate a 911 call and transit vessel to Swan Island boat ramp for EMS assistance. • If a severe injury occurs and a water rescue is needed, initiate a MAYDAY call. • Contact the AECOM Incident Reporting line after the emergency has been addressed.	4
	Heat stress/cold stress	10	• Begin heat stress/cold stress monitoring as applicable and continue throughout duration of task. • Implement heat stress/cold stress prevention procedures, as applicable. • Heat stress: drink plenty of fluids and use appropriate work/rest schedule. • Cold stress: dress in appropriate cold-weather clothing and bring change of dry clothing stored in waterproof bag. Review the cold stress management plan in Section 3.14.1 of the Programmatic HASP.	5
	Severe weather hazards	10	Include discussion of severe weather hazards in daily safety briefing and monitor throughout the duration of the task. Implement severe weather procedures as applicable. Stop work during severe weather.	4
	Other commercial/recreational vessel traffic hazards	10	Adhere to all federal, state, and local boating and licensing laws.	5
	Potential contaminant exposure (contaminated media)	10	• Awareness level training will be provided to the bathymetry Crew. Sediments and porewater are considered contaminated media, Avoid all contact with sediment and porewater. • Bathymetry survey crew is not anticipated to come into contact with potential chemical hazards. If scope of work changes or contact with contaminated media (i.e., sediment or porewater) occurs, immediately stop work and contact Jennifer Pretare.	3

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Potential chemical exposure (support substances for project including fuel for vessels)	10	• While fueling, there is potential exposure to gasoline fuel. • All crew members will remain upwind from the fueling operation. • Nitrile gloves will be worn while fueling the vessel. • For incidental spill response procedures, refer to Section 12 of the programmatic HASP. • Any impacted material following an incidental spill will be disposed of appropriately.	3
	Lifting hazards/muscle strain/ergonomic hazards	6	• Practice proper lifting and manual handing of materials and equipment, lift with the knees, avoid twisting, and seek assistance or employ additional handling equipment as needed. • Wear abrasion gloves when moving equipment. • No personnel should lift more than 40 pounds without assistance or mechanical aid. Know what items weigh before lifting or test them carefully. • Transfer equipment to people on boat rather than carrying equipment onto boat.	3
Activity 6 – Use of Personal Watercraft/Jet Skis to perform survey	Losing control of personal water craft	10	• Training: All employees will be trained in the proper and safe operations of personal watercraft. Key operational reminders will be discussed during daily tailgate meetings. • Competent Persons: only competent persons will operate the personal watercraft. Competent people are listed above in the HASP Addendum for Bathymetry. • Fatigue Management: The Site Safety Officer and Field Manager will monitor team members for fatigue; if any team member feels fatigued, they are to notify the Field Manager immediately and not perform work. Communication throughout the activity will occur with the personal watercraft operator to assess fatigue. • Personal watercraft operators will communicate by voice or radio with the team continuously.	3
	More exposure to pinch points due to size	10	• Training: All employees will be trained in the proper and safe operations of personal water craft. Refresher training will occur during the daily tailgate meetings • Competent Persons: Only competent persons will operate the personal watercraft. These people are listed above in the HASP Addendum for Bathymetry. • Fatigue Management: The Site Safety Officer and Field Manager will monitor team members for fatigue; if any team member feels fatigued they are to notify the Field Manager immediately and not perform work.	3
	Immersion into river water	10	• Training: All employees will be trained in the proper and safe operations of personal water craft. Training has also included self-rescue and remounting should an operator fall off. Key points will be discussed during daily tailgate meetings. • Coworkers will watch the personal water craft operator from vessel or shore to eliminate lone worker scenarios. • The watercraft will be equipped with an automatic shut off/idle down should the operator fall off the personal watercraft. • The operator shall attempt to remount the personal watercraft. If they are unable, signal for help and follow MOB procedures above. • PPE: The proper PPE will be a USCG Type III or IV life vest, dry suit, and whistle for notification that assistance is needed	3

Principal Activities	Potential Safety/Health Hazards	Initial Risk Rating	Control Measures	Final Risk Rating
	Incidental (non-planned) contact with sediment	10	• Training: Bathymetry work will not contact sediment. A list of potential chemical hazards which are found in sediment are provided in Section 8.1. Bathymetry workers are to avoid contact with Porewater and sediment. Additional discussion regarding the contaminated media will be discussed during the daily tailgate meeting. • Water craft shall be launched and retrieved where areas where sediment contact is not possible. • Water craft will not be beached during the survey. • If conditions change, Stop Work and contact the Project Manager. • For incidental contact with sediment, an emergency decontamination kit including deionized water and Alconox will be present at the launching area and on survey vessels.	3
	Incidental Spill	10	• Workers are trained to respond to small incidental spills by deploying absorbent pads. Should a large spill occur, they are to follow emergency procedures outlined in Section 12 of the Programmatic HASP. • Contact the Project Manager or SH&E lead immediately. • Nitrile gloves will be worn when responding to small spills to prevent dermal contact. Absorbent pads will be retained in impermeable plastic bags. Bags will be disposed of under the direction of the Project Manager or SH&E Manager in accordance with State and EPA regulations.	3
Activity 7– Use of Remotely Operated Vehicle	Incidental (non-planned) contact with sediment	10	• Workers will be trained in the proper operation of the Remotely Operated Vehicle (ROV). • Training: Bathymetry work will not contact sediment. A list of potential chemical hazards that are found in sediment are provided in the Programmatic HASP in Section 8.1. Bathymetry workers are to avoid contact with porewater and sediment. Additional discussion regarding the contaminated media will be discussed during the daily tailgate meeting. • The ROV will be retrieved using nitrile gloves, and the hull will be inspected for incidental contact with sediment. If there is presence of incidental contact with sediment, the team shall use deionized water to rinse the hull of the ROV prior to storing.	3
	Loss of power or contact with Remotely Operated Vehicle	10	• Retrieval will be based on location of where ROV loses power. The most likely response will involve using the larger vessel or personal watercraft to retrieve the ROV. • See “Incidental contact with contaminated sediment” above for information on how to decontaminate ROV.	3

SPECIAL REQUIREMENTS

Step #	Equipment to be Used	Inspection Requirements	Training Requirements
	List equipment to be used in work activity	List inspection/permit requirements for work activity	List training requirements including hazard communication
1.	Research vessel Personal Water Craft Remotely Operated Vehicle	Perform boat inspection prior to use. Complete and submit float plan prior to use. Perform inspection for incidental contact with sediment on hulls of personal watercraft, vessels, and ROV.	USCG-licensed vessel operator or equivalent. MOB recovery with limited assistance. First Aid/CPR Training. Approved boating safety course.
2.	Emergency equipment provided by vessel operator: • GPS • Satellite phone (if cell phone service does not cover entire survey area) • VHF radios will remain on Channel 16 (for hailing/distress calls) at all times to listen for boat traffic, alerts, etc. unless actively keying/ communicating on another channel with another party • Rescue rope in throw bag (commercially available) or Life Sling • Horn (portable or fixed) and/or whistles • Waterproof flashlight • If vessel is not twin engine, a *secondary “kicker” motor or alternate means of propulsion (oars or paddles) • *Manual bilge pump • *Duct tape • *Mooring lines for securing boat on shore or alongside larger vessel • *Functional bilge pump/emergency pump • *Anchor with suitable sized anchor, 300 feet of anchor rope and 10 feet of chain • *Type 4 throwable ring or cushion • *Type BC fire extinguisher (10 pound) if extra fuel is carried in portable containers. * Required minimum equipment to be provided by vessel provider (chartered boat); project Field Coordinator to ensure remaining equipment is carried on board.	Inspect all equipment for battery life and integrity during the pre-trip boat inspection.	Personnel should be familiar with all emergency equipment.

3.	Immersion Suits for donning in cold water conditions	Inspect annually and service as required.	Crew shall practice donning annually.
4.	Revere Coastal Contact Life Raft	Inspect annually and service as required.	Review of deployment procedure.
5.	Spill Kit which includes: Nitrile Gloves Absorbent pads (which will include absorbent booms) Container/bags to collect used spill equipment.	Inspect annually and service as required.	Review spill response procedure.
6.	Click here to enter text.	Click here to enter text.	Click here to enter text.
7.	Click here to enter text.	Click here to enter text.	Click here to enter text.
8.	Click here to enter text.	Click here to enter text.	Click here to enter text.
9.	Click here to enter text.	Click here to enter text.	Click here to enter text.

INSTRUCTIONS AND RISK MATRIX

Hazard Evaluation – Identify principal steps of the task. Identify potential safety/health hazards for each step and determine initial risk rating using the matrix provided below. Identify control measures including PPE for each hazard. Re-evaluate hazard potential and assign a final risk rating. If the final risk rating is a 5-9 (medium risk) or 10-25 (high risk), additional hazard controls shall be identified and applied until the final risk rating is reduced to 4 or below. The final risk rating cannot be reduced to 4 or lower, additional approvals are needed before the activity can begin. Add additional rows as required to cover all major steps/aspects of the activity.

Special Requirements – Identify equipment to be used including specific PPE required. Identify inspection requirements such as competent person, permit issue, documented task hazard analysis, etc. Identify training requirements such as hazard communication, scaffold user, fall protection, etc.

High ⟷ Low

Probability	Severity				
	5 - Catastrophic	4 - Critical	3 - Major	2 - Moderate	1 - Minor
5 - Frequent	25	20	15	10	5
4 - Probable	20	16	12	8	4
3 - Occasional	15	12	9	6	3
2 - Remote	10	8	6	4	2
1 - Improbable	5	4	3	2	1

High ↕ Low

10-25 (red) are high risk, 5-9 (yellow) are medium risk, and 1-4 (green) are low risk

Severity – Potential Consequences				
	People	Property Damage	Environmental Impact	Public Image/Reputation
Catastrophic	Fatality, Multiple Major Incidents	>$1M USD, Structural collapse	Offsite impact requiring remediation	Government intervention
Critical	Permanent impairment, Long term injury/illness	>$250K to $1M USD	Onsite impact requiring remediation	Media intervention
Major	Lost/Restricted Work	> $10K to $250K USD	Release at/above reportable limit	Owner intervention
Moderate	Medical Treatment	> $1K to $10K USD	Release below reportable limit	Community or local attention
Minor	First Aid	</=$1K USD	Small chemical release contained onsite	Individual complaint

Probability		
Frequent	Expected to occur during task/activity	9/10
Probable	Likely to occur during task/activity	1/10
Occasional	May occur during the task/activity	1/100
Remote	Unlikely to occur during task/activity	1/1,000
Improbable	Highly unlikely to occur, but possible during task/activity	1/10,000

Risk Rating (Probability x Severity)	Risk Acceptance Authority
1 to 4 (Low)	Risk is tolerable, manage at local level
5 to 9 (Medium)	Risk requires approval by Operations Lead/Supervisor & SH&E Manager
10 to 25 (High)	Risk requires the approval of the Operations Manager & SH&E Director